

SILVER SPRINGS MUTUAL WATER COMPANY

WATER CONSERVATION PLAN



OWNER:
SILVER SPRINGS MUTUAL WATER COMPANY
PO BOX 285
SILVER SPRINGS, NEVADA 89429
(775) 577-2223

ENGINEER:
FARR WEST ENGINEERING
5442 LONGLEY LANE
RENO, NEVADA 89511
(775) 851-4788

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This Water Conservation Plan has been prepared for the Silver Springs Mutual Water Company (SSMWC). The purpose of the plan is to develop a water-use profile, identify and evaluate conservation measures and incentives, and set goals to encourage conservation efforts in the SSMWC service area.

There are several reasons why it is important for both SSMWC and its customers to conserve water. The climate in the SSMWC service area is typical of that in the Great Basin High Desert. Summers are hot and dry with average high temperatures exceeding 90° F. Annual precipitation is light at 5.43 inches in an average year. Because of this ground water recharge from surface runoff is almost non-existent. Additionally, although water from the wells is generally of good quality, testing indicates that all four SSMWC wells exceed the latest EPA imposed arsenic limit of 10ppb. Bringing the wells into compliance with this new limit will require treatment and/or locating new water sources. Both of these options are expensive and conservation could help to reduce costs.

The Nevada State Demographer predicts that the annual growth rate in Lyon County will be 1.2% over the next 20 years. SSMWC historical data indicates a 1.6% annual growth rate and 1990-2000 Census data forecasts a 4.3 rate. A reasonable average rate of 2.4% can be used to estimate annual growth. Per the 2000 Census the average household size in Silver Springs is 2.59 persons and SSMWC currently serves 1,047 total connections with 940 of those being residential. Table A provides annual population projections based on these statistics.

TABLE A

Annual Population Projections

Year	Average Projection 2.4%
2005	2435
2006	2493
2007	2553
2008	2614
2009	2677
2010	2741
2011	2807
2012	2874
2013	2943
2014	3014
2015	3086
2016	3160
2017	3236
2018	3314
2019	3393
2020	3475
2021	3558
2022	3644
2023	3731
2024	3821

Although population growth is not expected to unduly burden the water supply, it will result in increased water use over time. As demand increases new facilities will need to be built. Conservation could be used to defer construction of such facilities.

This plan includes information to help water customers conserve water. SSMWC also will participate in conservation efforts by working to reduce unaccounted for water and acting as a source of education for water users. In addition to this conservation plan, the Preliminary Engineering Report created by Farr

West Engineering in May 2004 can be used as a resource to implement and measure the effectiveness of conservation efforts, conservation planning and project financing.

This plan is compliant with Nevada Revised Statutes (NRS) sections 540.121 through 540.151 and is available for public inspection at the following location:

**Silver Springs Mutual Water Company
1315 Lahontan St
Silver Springs, NV 89429
(775) 577-2223**

Public comments about this plan are encouraged. Written comments may be sent to:

**Silver Springs Mutual Water Company
P.O. Box 285
Silver Springs, Nevada 89429**

SECTION 1 – CONSERVATION GOALS

This section includes goals intended to increase conservation. Because SSMWC provides service to a small number of customers, goals that match staff and budget limitations were selected.

1.1 Creation of a Conservation Budget

A conservation budget will be established to finance the implementation of conservation related measures/incentives. Funds will be set aside for both materials and labor.

1.2 Creation of a Conservation Education Program

A conservation education program should be created. The program could include educational materials for both adults and school age children. Materials to be distributed could include conservation related pamphlets and conservation kits (potential contents of kits include toilet flappers, tank dams, washers, hose repair kits, toilet tank leak detecting dye tablets, low flow shower heads, etc...). Pamphlets may be distributed with water bills and/or during visits to local schools, community events, 4-H and Boy and Girl Scout activities.

1.3 System Monitoring

The water use profile will be analyzed on an annual basis. Parameters to be monitored and analyzed include:

- Water use by customer class
- Increases or decreases in use
- Gallons used per capita per day
- Increases or decreases in unaccounted-for water

1.4 Conservation Specialist

A SSMWC staff member will be assigned to oversee conservation efforts within the service area. This conservation specialist will be responsible for the implementation of conservation programs as well as the monitoring of water use. The conservation specialist will also review and revise the conservation plan as needed.

1.5 Conservation Plan Review

This plan will be reviewed and revised every five (5) years. Plan adoption and revision will conform to NRS 540.131 (2) and (4). Per these sections any interested person "including, but not limited to, any private or public entity that supplies water for municipal, industrial or domestic purposes, shall have the opportunity to submit written views and recommendations on the plan." Every revision will be made available for inspection by these persons or entities.

END OF SECTION

SECTION 2 – WATER USE PROFILE AND FORECAST

Section 2 develops a water use profile and forecast for the SSMWC service area. The section will include:

- Water rights information
- Existing supply sources and their production
- System water use profile with customer classifications and unaccounted for water
- Water use forecast using projected population growth

The purpose of this section is to establish a basis for conservation measures and incentives.

2.1 Water Rights

Table 2.1 is a summary of current water rights permits held by SSMWC. The Atkins St. Well is used for monitoring only. Appendix F includes a map showing the points of diversion for the permits.

TABLE 2.1

Summary of SSMWC Water Rights

Well Number and Name	Point of Diversion	Permit Numbers	Max Rate of Diversion (CFS)	Max Annual Use (MGA)
W01- Ft. Churchill Well	SW _{1/4} SW _{1/4} S19 T18N R25E S11° 14' 33" W, 1662.84 ft	36639	2.93	695.29
		60752	0.07	12.41
			3	707.7
W02- Deodar St. Well	SE _{1/4} NE _{1/4} S25 T18N R24E From Which the East Corner Bears S41° 30' 30" E, 1629.00 ft	36637	2.93	695.29
		60750	Changed by 62586	0
		62586	0.07	12.41
			3	695.29
W03-Atkins St. Well	SE _{1/4} SE _{1/4} S26 T18N R24E From Which the Southeast Corner Bears S42° 30' E, 110.00ft	36640	2.85	221.19
		60753	0.15	12.41
			3	233.6
W04-Idaho St. Well	NW _{1/4} NW _{1/4} S30 T18N R25E From Which the Northwest Corner Bears N11° 44' 36" W, 1187.52 ft	36638	2.93	695.29
		66171	0.178	0.528
		66172	0.25	5.21
		66173	0.037	2.63
		60751	0.07	12.41
			3.465	716.068
W05-Lake St. Well	NE _{1/4} NE _{1/4} S30 T18N R25E Bearing N80° 38' 32" E, 802.00 ft	36636	3.93	931.21
		60749	0.07	12.41
		62912	0.5	24.31
		62913	0.5	24.31
		65267 Filed under 38968	0.2	12.41
			5.2	1004.65

* See Permit 62913- The total combined duty of water under Permits 36636, 36637, 36638, 36639, 36640, 62912 and 62913 shall not exceed 1,132,695,500 gallons annually.

The water rights listed above could allow for sufficient water to serve 3,040 units. Each unit requires 1.12 acre-feet of water. Currently SSMWC is committed to provide water service to users within the service territory which equal 1,494 units. Accordingly, approximately 1,546 units may still be served by the water rights represented by the water permits. It should be noted that of the 5 wells only 4 are in use. Well number 3, the Atkins Well, is used for monitoring purposes only. Also, the numbers assigned to the wells by the State Engineer's Office do not coincide with the well numbers assigned by the State Health Department for monitoring purposes.

2.2 Storage

There are two water storage tanks in the system. The North Tank, which has a capacity of one million gallons is located just to the east of US Hwy 95A North near the Hwy 95A and Hwy50 intersection. The West Tank is located near the Skyline Subdivision and has a capacity of one million gallons.

2.3 Water Use Profile

MVWD provides water for the following basic categories of water consumers:

- Metered Residential Customers
- Metered Commercial Customers
- Metered Industrial Customers

Figure 2.1 shows the customer use by class for 2001 through 2005. The chart indicates that residential use has remained flat, industrial use has decreased and commercial use has increased.

FIGURE 2.1

Water Used by Customer Class 2001 Through 2005

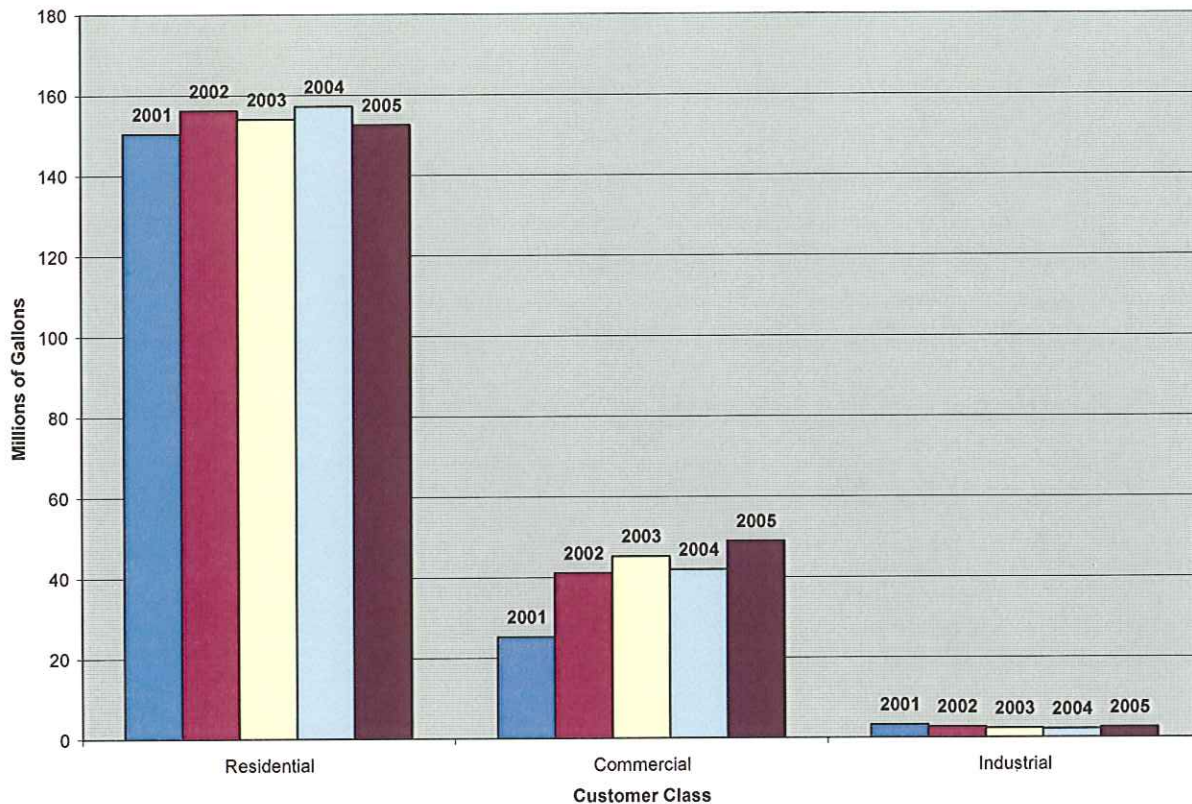
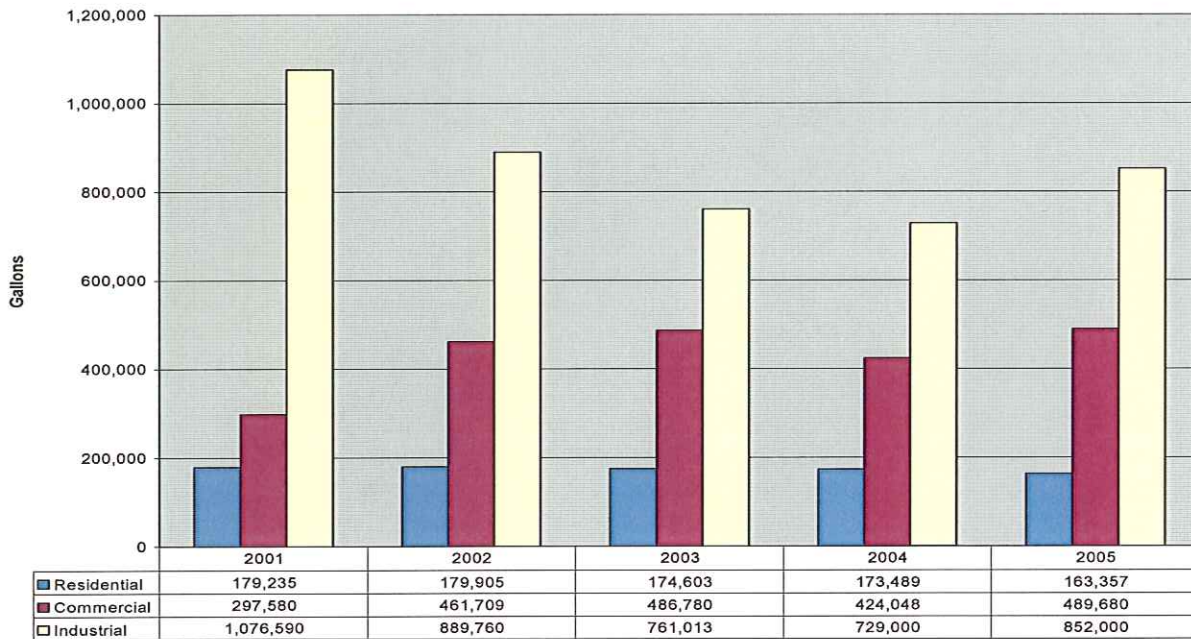


Figure 2.2 shows use per connection for 2001 through 2005. It is important to note that although commercial connections make up only 10% of all connections, they account for 22 percent of all water consumed (see Figure 2.5).

FIGURE 2.2

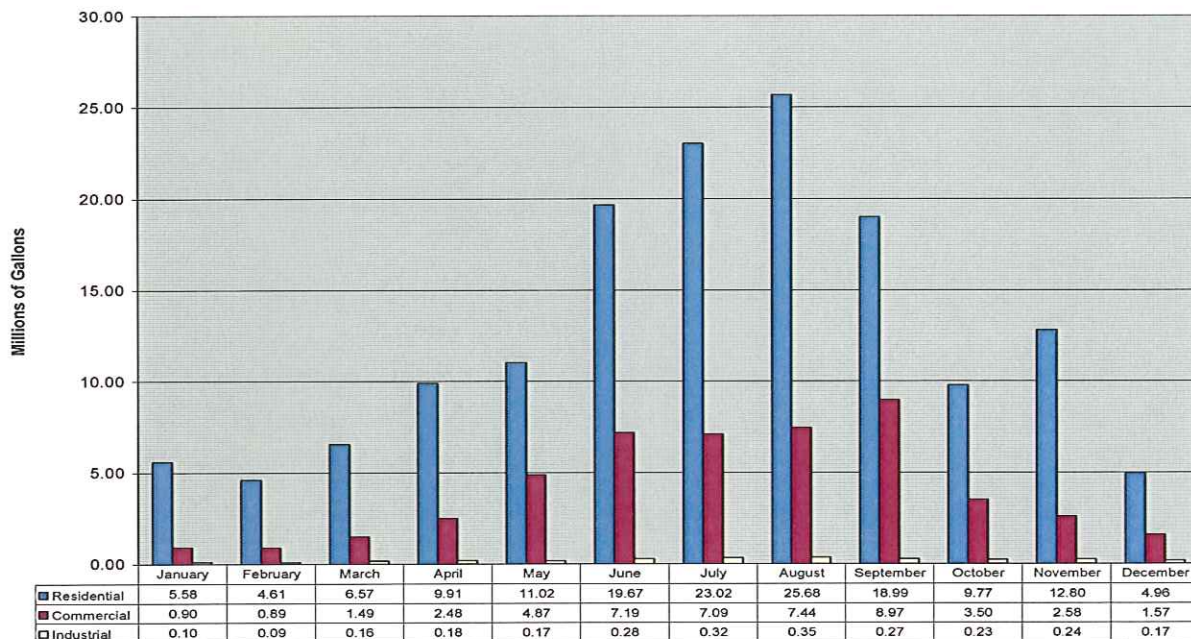
Use per Connection by Customer Class - 2001 Through 2005



Monthly water use for 2005 is illustrated in Figure 2.3. Landscaping accounts for 70 to 75% of residential water use during summer months. Commercial use increases in the summer as well. This is probably due to an increase in visitors to nearby Lahontan Reservoir. Some commercial users also have landscapes that require irrigation. Industrial use remains the same year round.

FIGURE 2.3

SSMWC Monthly Customer Water Use 2005

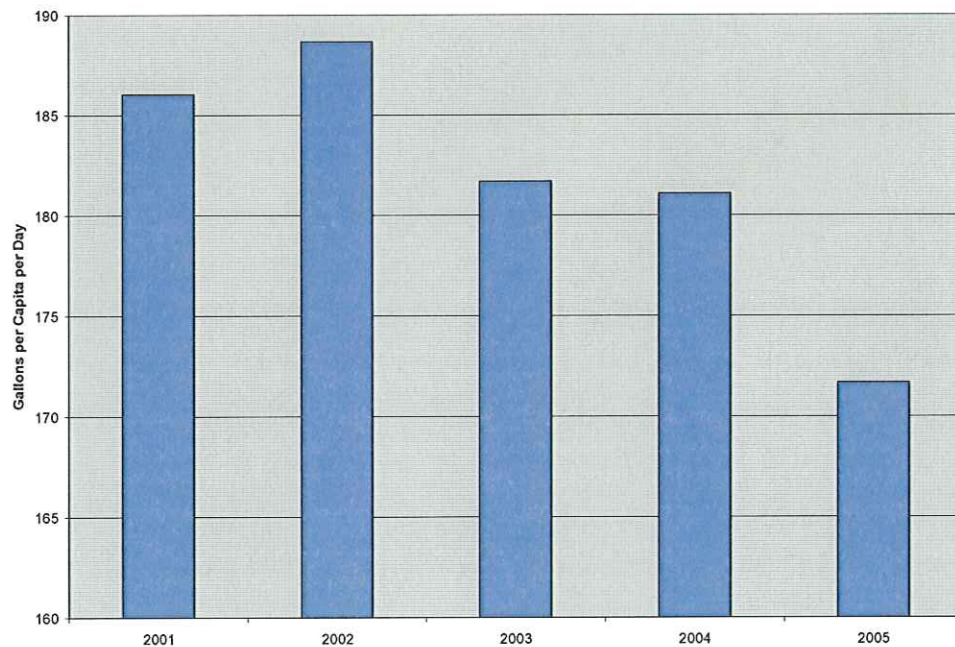


According to the State of Nevada Division of Water Resources website, the estimated average individual water use in the State is 200 gallons per capita per day (gpcd). Per capita use in the SSMWC service

area has steadily decreased from 186 gpcd in 2001 to 172 in 2005. Figure 2.4 shows SSMWC service area gpcd for 2001 through 2005.

FIGURE 2.4

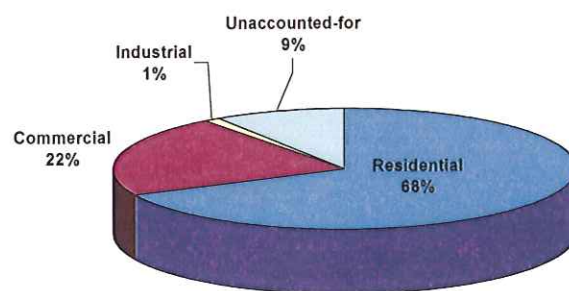
Gallons per Capita per Day - 2001 Through 2005



Residential customers consume most of the water produced (See figure 2.5). For this reason conservation efforts should be focused on this customer class. Figure 2.5 includes use percentages for all SSMWC consumer categories as well as unaccounted-for water.

FIGURE 2.5

Consumption for All Customer Classes – 2005



Pumping records indicate the average unaccounted-for water is 10% for the period 2001 through 2005. Generally the factors that contribute to unaccounted water are leaks, inaccurate record data, illegal or un-

metered water connections, fire hydrant testing, construction water, etc. See section 4.2.1 regarding the detection and reduction of unaccounted-for water.

2.4 Water Demand Forecast

Table 2.1 is a forecast of SSMWC customer water use for the next 20 years. The projections are made based upon the following assumptions:

1. Residential connections will increase at the current average rate of 3% per year
2. Commercial connections will increase at the current average rate of 4% per year
3. Industrial connections will continue to be 0.3% of total connections
4. Unaccounted-for water will continue to be 9% of total water produced
5. 2005 average use-per-connection will remain the same for all customer classes. 2005 annual use-per-connection amounts (in gallons) are:
 - Residential = 163,357
 - Commercial = 489,680
 - Industrial = 852,000
6. 2005 connection totals are: Residential, 940; Commercial, 100; Industrial, 3

TABLE 2.1

SSMWC Service Area Estimated Water Use – 2005 Through 2025

PROJECTED WATER USAGE (Millions of Gallons)					
Year	Residential	Commercial	Industrial	Unaccounted-for	Total
2005	153	49	3	20	224
2006	157	51	3	21	232
2007	161	53	3	21	238
2008	165	55	3	22	245
2009	169	57	3	23	252
2010	173	60	3	23	259
2011	177	62	3	24	266
2012	181	64	3	25	273
2013	186	67	3	25	281
2014	190	70	3	26	289
2015	195	72	3	27	297
2016	199	75	4	28	306
2017	204	78	4	28	314
2018	209	82	4	29	323
2019	214	85	4	30	332
2020	219	88	4	31	342
2021	224	92	4	32	352
2022	230	95	4	33	362
2023	235	99	4	34	372
2024	241	103	4	34	383
2025	247	107	4	35	394

SSMWC has total pumping rights of 1,133 million gallons annually but is currently pumping only 224 million. This means an additional 908 millions gallons can be pumped annually. Table 2.2 is a modification of table 2.1 showing the estimated effects of conservation over the same period.

TABLE 2.2

SSMWC Service Area Estimated Water Use w/ Conservation – 2005 Through 2025

PROJECTED WATER USAGE (Millions of Gallons)					
Year	Residential Use	Commercial Use	Industrial Use	Unaccounted-for	Total
2005	148	49	3	20	219
2006	157	51	3	21	231
2007	160	53	3	20	235
2008	163	54	3	19	240
2009	166	56	3	19	244
2010	169	58	3	18	248
2011	172	60	3	17	252
2012	175	62	3	16	256
2013	178	64	3	15	261
2014	181	66	3	14	265
2015	184	69	3	13	269
2016	187	71	3	14	275
2017	192	74	3	14	283
2018	196	77	3	15	291
2019	201	80	4	15	299
2020	206	83	4	15	308
2021	211	86	4	16	317
2022	216	90	4	16	326
2023	221	93	4	17	335
2024	226	97	4	17	345
2025	232	101	4	18	355

FIGURE 2.6

Comparison of Projected Rights and Demands

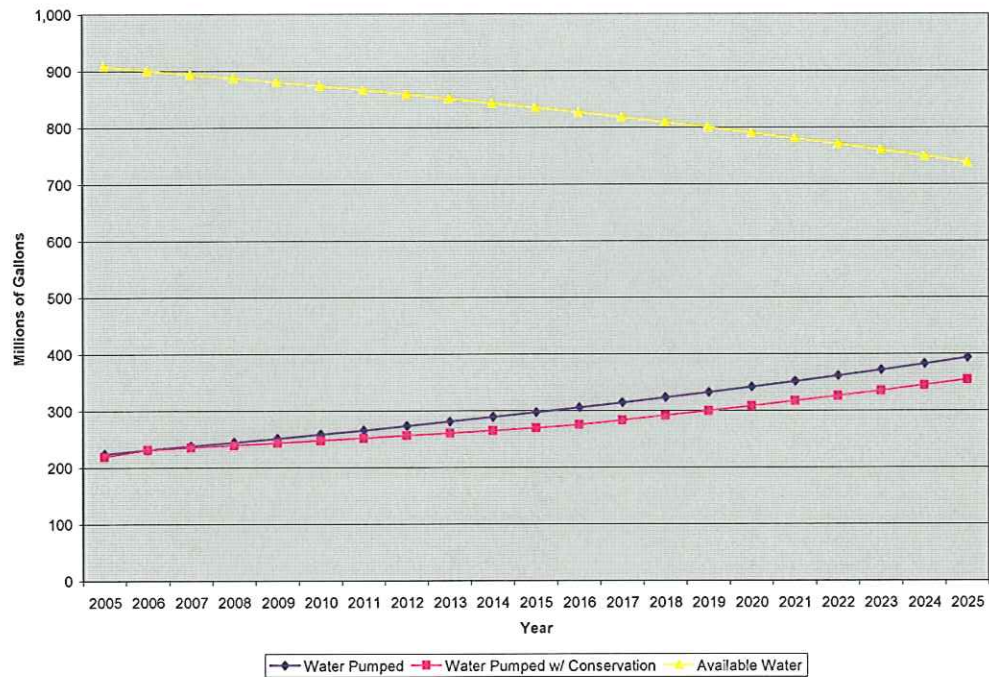


Figure 2.6 compares water demand projections with and without conservation. Conservation estimates include a 45% reduction in unaccounted-for water and a 6% reduction in customer demand. The total combined water conserved would equal 10%. It is assumed that conservation measures and incentives begin to produce a 0.6% decrease in demand starting in 2007. Demand then continues to decrease at a rate of 0.6% per year until 2016. From 2017 on, demand continues to be 10% less than what it would be without conservation. This projection is dependent on the effectiveness of conservation measures and incentives. It also requires that unaccounted-for water be maintained at an amount equaling 5% or less of the total pumped and that consumer demand can be reduced by 6%. It should be noted that conservation projections at this time are only estimates. The amount of water saved depends on the effectiveness of conservation programs and the participation of water users.

END OF SECTION

SECTION 3 – CONSERVATION INCENTIVES

Conservation incentives are those things that increase awareness and encourage conservation. There are three general categories of conservation incentives; Educational, Financial, and Regulatory.

3.1 Educational Conservation Incentives

3.1.1 Literature. The American Water Works Association (AWWA) prints educational pamphlets dealing with all facets of residential conservation. These pamphlets provide how-to information as well as facts that encourage conservation. These materials can be distributed through customer billings, at public events, in schools, in public buildings and at the SSMWC office. Appendix A includes examples of AWWA pamphlets.

3.1.2 Conservation Kits. The distribution of conservation kits can be a good way to encourage conservation. These kits range in cost from \$2.00 to \$30.00 and can be sold to customers or provided free of charge. Kits may also be distributed to new customers at the time of hook-up. Appendix G includes examples of conservation kits produced and sold by Niagara Conservation.

3.2 Financial Conservation Incentives

3.2.1 Rates. The SSMWC system is divided into two pressure zones with their associated rates. SSMWC uses a declining block rate structure for most of its connections, the exception being the ¾ inch zone 1 residential connections. In a declining block rate structure the cost per unit volume decreases with usage. Therefore, the more units of water that a consumer uses, the less the units will cost after a certain threshold. This type of rate structure does not encourage conservation.

SSMWC rates are shown in tables 3.1 and 3.2. Note that for a 1 inch, zone 1 residential connection the price for the first 30,000 gallons is \$36.00. After the first 30,000 gallons the price is \$1.00 per 1,000. This makes the price per gallon less after the first 30,000 gallons.

TABLE 3.1

Residential Rates

Connection (inch)	Gallons Per Minute (GPM)	Zone 1 Residential Base	Zone 2 Residential Base
3/4	9.46	\$ 28.00	\$ 32.00
1	16.59	\$ 36.00	\$ 42.00
1 1/2	36.96	\$ 40.00	\$ 45.00
2	65.94	\$ 50.00	\$ 58.00
3	148.47	\$ 74.00	\$ 84.00
4	263.97	\$ 95.00	\$ 110.00
6	593.67	\$ 138.00	\$ 162.00
\$1.00 Per 1000 gallons after 30,000 gallons			
* for 3/4 inch meter installation \$650.00, over 3/4 inch actual costs apply.			

TABLE 3.2

Commercial and Industrial Rates

Connection (inch)	Gallons Per Minute (GPM)	Zone 1 Commercial Base	Zone 2 Commercial Base
3/4	9.46	\$ 32.00	\$ 36.00
1	16.59	\$ 40.00	\$ 42.00
1 1/2	36.96	\$ 46.00	\$ 49.00
2	65.94	\$ 54.00	\$ 62.00
3	148.47	\$ 78.00	\$ 88.00
4	263.97	\$ 99.00	\$ 114.00
6	593.67	\$ 142.00	\$ 166.00
\$1.00 Per 1000 gallons after 30,000 gallons			
* for 3/4 inch meter installation \$700.00, over 3/4 inch actual costs apply.			
*Trailer Parks, Apartments, Hotels, Motels Add \$22.00 Per Unit for Both Zones.			

SSMWC will soon be conducting a rate study as part of a system improvement project. The study will help determine what kind of rate structure should be used to more effectively encourage conservation.

3.2.2 Savings from Efficient Plumbing Fixtures. Even though the Federal Energy Policy Act (FEPA) has mandated the manufacture and installation of efficient plumbing fixtures since 1994, there are still inefficient fixtures and appliances in use. Table 3.3 shows the potential savings from efficient fixtures.

TABLE 3.3

Potential Water Savings

Fixture*	Fixture Capacity	WATER USE (gpd)		WATER SAVINGS (gpd)	
		Per Capita	Per Household**	Per Capita	Per Household**
<i>Toilets***</i>					
Efficient	1.6 gal/flush	6.0	16.2	N/A	N/A
Low-Flow	3.5 gal/flush	14.0	37.8	8.0	21.6
Conventional	5.5 gal/flush	22.0	59.4	16.0	43.2
Conventional	7.0 gal/flush	28.0	75.6	22.0	59.4
<i>Showerheads†§</i>					
Efficient	2.5 [1.7] gal/min	8.2	22.1	N/A	N/A
Low-Flow	3.0 to 5.0 [2.6] gal/min	12.5	33.8	4.3	11.7
Conventional	5.0 to 8.0 gal/min	16.3	44.0	8.1	22.0
<i>Faucets†§</i>					
Efficient	2.5 [1.7] gal/min	6.8	18.4	N/A	N/A
Low-Flow	3.0 [2.0] gal/min	8.0	21.6	1.2	3.2
Conventional	3.0 to 7.0 gal/min	13.2	36.6	6.4	17.2
<i>Fixtures Combined</i>					
Efficient	N/A	21.0	56.7	N/A	N/A
Low-Flow	N/A	34.5	93.2	13.4	36.4
Conventional	N/A	54.5	147.2	33.5	90.4

Source: Amy Vickers, "Water Use Efficiency Standards for Plumbing Fixtures: Benefits of National Legislation", *American Water Works Association Journal*, Vol 82 (May 1990): 53

*Efficient = post-1994, Low-Flow = post-1980, Conventional = pre-1980; **Assumes 2.7 persons per household.

***Assumes four flushes per person per day. Does not include losses through leakage.

†For showerheads and faucets: maximum rated fixture capacity [measured fixture capacity]. Measured capacity equals about 2/3 the maximum.

§Assumes 4.8 shower-use-minutes per person per day and 4.0 faucet-use-minutes per person per day.

The potential savings shown in table 3.3 could make a plumbing retrofit program feasible.

3.3 Regulatory Conservation Incentives

3.3.1 Codes and Ordinances. Currently in Silver Springs there are no ordinances governing the waste of water. Lyon County has been working on a Landscape Code that once completed will be included in Appendix C. Conservation measures included in the proposed code are:

- Irrigation requirements
- Turf limits
- Plant selection
- Mulch limits

In addition to Landscape code requirements, residential users should be encouraged through conservation education to limit turf amounts and use automatic sprinkler and drip technologies for irrigation systems. They should also be encouraged to use plants that thrive with relatively little water in the high desert climate of Silver Springs. A list of such plants is included in Appendix D.

END OF SECTION

SECTION 4 – CONSERVATION MEASURES

This section describes current and planned conservation measures within the SSMWC service area. A conservation measure is a device or practice that reduces water consumption. Conservation measures are divided into two fundamental categories; 1. Hardware or equipment and, 2. Behavior or management practices. Examples of hardware measures include low-volume toilets and irrigation rain sensors. Examples of behavioral measures include not using the toilet as a trash can and watering lawn less frequently.

Some conservation measures are mandated by state and/or federal laws and others are voluntarily implemented by local water purveyors and/or customers. This section describes both current MVWD conservation measures and those that the District plans to implement in the future.

4.1 Federal Plumbing Standards

The most recent federal plumbing standards (table 4.1) are included here since these standards are applicable in the SSMWC service area. It is important to include California's standards for reference since in most cases California's requirements are more stringent. The comparison infers that there are plumbing fixtures available that exceed federal efficiency requirements thereby offering consumers alternatives that maximize conservation efforts.

TABLE 4.1

Federal and California Plumbing Standards

Device	FEDERAL ENERGY POLICY ACT (FEPA)		CALIFORNIA	
	Manufacture	Effective Date	Sale and Installation	Effective Date
Shower Heads	2.5 gpm*	1/1/94	2.5 gpm	3/20/92
Lavatory Faucets	2.5 gpm	1/1/94	2.2 gpm	3/20/92
Sink Faucets	2.5 gpm	1/1/94	2.2 gpm	3/20/92
Metering Faucets	*	1/1/94	†	7/1/92
Tub Spout Diverters	Not included in FEPA		0.1 to 0.3‡	3/20/92
Residential Toilets	1.6 gpf	1/1/94	1.6gpf	3/20/92
Flushometer Valves	1.6 gpf§	1/1/97	1.6 gpf	1/1/92
Commercial Toilets	1.6 gpf	1/1/97	1.6 gpf	1/1/94
Urinals	1.0 gpf	1/1/94	1.0 gpf	1/1/92

* Gallons per minute.

** 0.25 gal/cycle (pertains to maximum water delivery per cycle).

† Hot water maximum flow rate range from 0.25 to 0.75 gal/cycle and/or from 0.5 gpm to 2.5 gpm, depending on controls and hot water system.

‡ 0.1 (new), to 0.3 gpm (after 15,000 cycles of diverting).

§ Gallons per flush.

4.2 SSMWC Conservation Measures

4.2.1 Reduction in Unaccounted-for Water. SSMWC is planning to implement improvements that will increase the efficiency of the water distribution system. It is anticipated that these improvements will decrease the percentage of unaccounted-for water. Some of the proposed improvements include the replacement of old water line, lining of an existing tank and SCADA system upgrades.

Additionally, all detected leaks will be promptly repaired and SSMWC will continue to monitor unaccounted-for water by comparing meter and pumping records.

4.2.2 Use of Treated Effluent. Currently Silver Springs does not have the capability to reuse water in the form of treated effluent. It is unknown when or if the facilities needed to reuse water will be available in the Silver Springs area. If the necessary facilities are installed, a plan will be created to use treated effluent.

4.2.3 Drought Measures. Information provided in the State of Nevada (State) Drought Plan can be used to determine when and if drought conservation measures are necessary. The State plan summarizes the different types of drought and stages of severity with corresponding triggers and actions. The following italicized text taken from the State drought plan defines the types of drought that potentially could affect the Silver Springs area.

- ***Meteorological Drought***

This type of drought is often defined by a period of well-below-normal precipitation. The commonly used definition of meteorological drought is an interval of time, generally of the order of months or years, during which the actual moisture supply at a given place rather consistently falls short of climatically appropriate moisture supply.

- ***Hydrologic Drought***

This typically refers to periods of below-normal streamflow and/or depleted reservoir storage.

- ***Economic Drought***

These droughts are a result of physical processes but concern the areas of human activity affected by drought (e.g., municipal water supply shortages). The human effects, including the losses and benefits in the local and regional economy, are often a part of this definition.

- ***Induced Drought***

A condition of shortage which results from over-drafting of the normal water supply. The condition is aggravated by negative precipitation experience and below normal stream flow or recharge. The "induced" drought is brought about by introducing agricultural, recreational, industrial or residential consumption into an area which cannot naturally support them.

Each type of drought will vary in severity, but all are closely related and caused by lack of precipitation.

The State plan establishes three basic drought severity stages; Drought Warning, Severe Drought and Drought Emergency. Severity is measured using the Palmer Drought Severity Index (Palmer, 1965). The State plan states; "This index is essentially a soil-moisture accounting or water balance method. It uses precipitation as input and evapotranspiration and ground-water recharge or deep percolation as outputs to compute an accumulated value of moisture deficiency or excess. The index values center around zero (average conditions) an range from roughly -4 (extreme drought) to +4 (extreme wetness)."

By combining elements of the State Drought Plan with local water monitoring and use reduction, SSMWC can use a hybrid approach to drought planning. For example, information gathered by the State Climatologist helps determine if drought conditions exist however, SSMWC is responsible for the implementation of conservation measures and incentives designed to reduce water consumption locally. Because of this, integration of State and local resources could help SSMWC take advantage of planning already done by the State and other government agencies.

The following includes the State drought severity stages combined with actions to be taken locally.

1. Drought Warning Stage

The drought warning stage begins when a determination has been made by the State Climatologist that, based on reservoir storage, precipitation, snowpack data and weather predictions, there is a possibility that river and stream flow will be below normal for a particular area (Palmer Index between -1.0 to -2.0).

Recommended actions:

- Increase monitoring of water supplies
- Begin creating public awareness of the water supply situation and the need to conserve.
- Twice-a-week watering; no watering between 1:00 p.m. and 5:00 p.m.
- Increased enforcement of water waste rules
- Implementation of landscape water budgets for irrigation customers. Assumes an amount of water use associated with various lot sizes. Exceedance of average water use by lot size would result in recommended audits
- Voluntary restaurant implementation of "no-water-served-unless-asked" policy

2. Severe Drought Stage

The severe drought stage begins when the Drought Review and Reporting Committee (DRRC) determines, based on reservoir storage, precipitation, snowpack data and weather predictions, there is a strong possibility that river and stream flow will be well below normal (Palmer Index -2.0 to -3.0).

Recommended actions:

- Eliminate unauthorized water use (e.g., idlers for construction water).
- Town and County committees initiate penalties for water waste.
- Eliminate the operation of non-recycling fountains or ponds.
- Require use of effluent for construction and dust control purposes.
- Call for wide-based community support to achieve conservation.
- Eliminate use of fire hydrants for other than fire protection.
- Expand no watering time from 1:00 p.m. to 5:00 p.m. to 10:00 a.m. to 7:00 p.m.
- Public education encouraging Spring or Fall plantings of new lawns
- Mandatory "no-water-served-unless-asked" policy

3. Emergency Drought Stage

The emergency drought stage begins when the DRRC determines, based on reservoir storage, precipitation, snowpack data, and weather predictions, there is a strong possibility that river and stream flow will be well below normal (Palmer Index below -3.0), and that there are significant unmet needs which cannot be met within existing state resources.

Recommended actions:

- All actions listed under drought warning and severe drought stages
- New lawn plantings prohibited during the months of Emergency Drought Stage
- Once-a-week watering possibly beginning during first month of Emergency Drought Stage
- Outdoor watering is limited to non-turf landscaping such as trees, shrubs and flower and vegetable gardens for the duration of the drought emergency. Consideration will be given to public irrigated recreation areas such as parks and schools as the water supply condition permits

4.3 Consumer Conservation Measures

4.3.1 Submetering. Submeters are meters installed in the main water lines that enter the individual units of multi-family properties (apartments, condominiums, duplexes, etc...) and/or subdivided areas of commercial, industrial, or institutional (ICI) facilities. Traditionally such properties and facilities were built with one master meter that served the entire complex or facility. Submeters can be used as a measure that property or company owners can use to conserve water and cut costs. Submetering has the following basic advantages:

- Decrease in overall water consumption of 18% to 39%¹
- Fair allocation of water costs to residents.
- Potential increase in property owners net operating income.
- Increase in water use efficiency
- Proper allocation of water costs within ICI operations

¹ *Submetering, RUBS, and Water Conservation*, prepared for the National Apartment Association and the National Multi Housing Council by Industrial Economics Incorporated, June 1999.

In residential applications, submeters can reduce consumption by making the individual users responsible for their own water bill. When water use by multi-family units is measured by a single meter, leaks in individual units often go undetected. Measuring the consumption of each unit may also discourage waste.

In industrial and commercial applications separate meters can be used for individual processes thereby encouraging use efficiency. Landscape irrigation can be monitored separately from facility use. Water costs can then be credited to the departments that use the water. Manufacturers can cut costs by determining which processes or equipment need to be improved or replaced.

There are some disadvantages to submetering. Retrofits may be expensive and may prove to be economically unfeasible. Also some of the financial incentive for landlords to install conservation devices (low-volume toilets and low-flow fixtures) is removed. These shortcomings however are not present in new construction. Whether new construction or retrofit, consideration should be given to both conservation and cost.

4.3.2 General Consumer Conservation Measures. Consumer residential, landscape, industrial, commercial and institutional measures are included in Appendix B.

END OF SECTION

5.1 Conservation Benchmarks

General benchmarks have been established by which the effectiveness of this conservation plan may be measured. Table 5.1 includes benchmarks taken from the Environmental Protection Agency (EPA) website that estimate residential water use.

TABLE 5.1

Residential Estimation Benchmarks

Parameter	Likely Range of Values
Average household size	2.0 – 3.0 persons
Frequency of toilet flushing	4.0 – 6.0 flushes per person per day
Flushing volumes	1.6 – 8.0 gallons per flush
Fraction of leaking toilets	0 – 30 percent
Showering frequency	0 – 1.0 showers per person per day
Duration of average shower	5 – 15 minutes
Shower flow rates	1.5 – 5.0 gallons per minute
Bathing frequency	0 – 0.2 baths per person per day
Volume of water	30 – 50 gallons per cycle
Washing machine use	0.2 – 0.5 loads per person per day
Volume of water	45 – 50 Gallons per cycle
Dishwasher use	0.1 – 0.3 Loads per person per day
Volume of water	10 – 15 gallons per cycle
Kitchen faucet use	0.5 – 5.0 Minutes per person per day
Faucet flow rates	2.0 – 3.0 gallons per minute

The benchmarks from table 1.1 can be used to estimate the daily ranges of personal and residential water usage. Table 1.2 shows the results of these calculations.

TABLE 5.2

Range of Indoor Water Use in Gallons per Day

Use	Per Individual (Low)	Per Individual (High)	Per Residence (Low)	Per Residence (High)
Toilets	6.4	48.00	16.6	124.32
Showers	0.00	75.00	0.00	194.25
Baths	0.00	10.00	0.00	25.9
Washing Machine	9.00	25.00	23.3	64.75
Dish Washer	1.00	4.50	2.59	11.65
Kitchen Faucet	1.00	15.00	2.59	38.85
Bathroom Faucet	1.00	9.00	2.59	23.31
Total	18.40	186.50	47.67	483.03

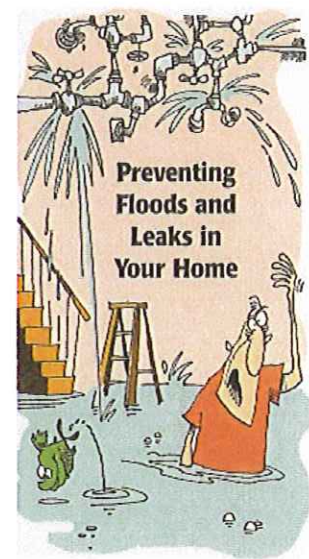
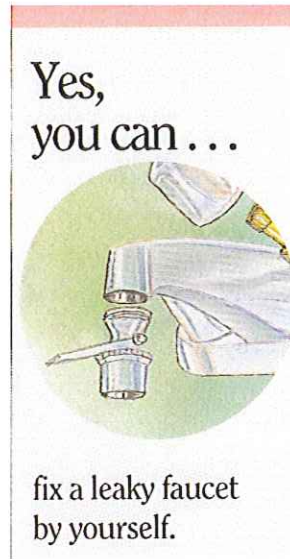
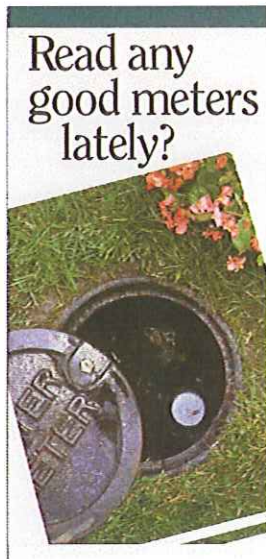
The residential ranges in table 5.2 were established using an average household size of 2.59 persons per residence (taken from the 2000 United States Census for Silver Springs). According to the table the average household would use 395 gallons per day (gpd). MVWD customers used 211 gallons per day per residence in 2004. Although MVWD customers average use is below 395 gpd, there is still room for improvement. Table 2.6 estimates that 10 percent of the total amount used from 1998 to 2020 can be conserved. By applying that same 10 percent to the average residential total over that same period of time (assuming the 2004 residential daily usage of 211 gpd), each residence should save approximately 180,000 gallons over 23 years.

Read any good meters lately? Guide provides instruction for reading and interpreting meter information. It also teaches water customers how to measure the amount of water they use in different applications (see figure 3.1).

Yes, you can...fix a leaky faucet by yourself pamphlet gives step-by-step instructions on how to fix a leaking faucet. It includes a list of tools necessary to perform the repairs (see figure 3.2).

FIGURES 3.1, 3.2, and 3.3

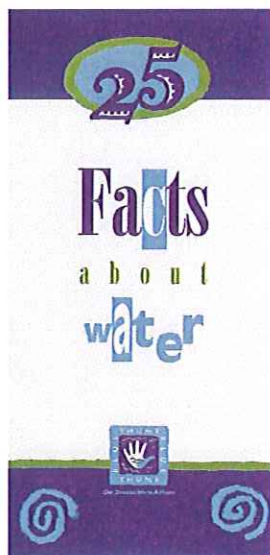
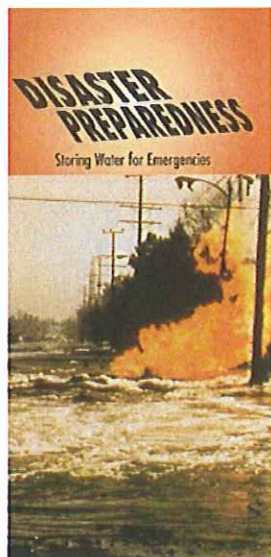
AWWA Conservation Pamphlets



Preventing Floods and Leaks in Your Home emphasizes the importance of locating a master valve and discusses where it might be. It also deals with faucet, toilet, and hose leaks (see figure 3.3).

Disaster Preparedness, Storing Water for Emergencies addresses four important emergency questions; How much water should be stored, How long can tap water be stored safely, What is a boil water order, and How will I know when the water is safe again (see figure 3.4).

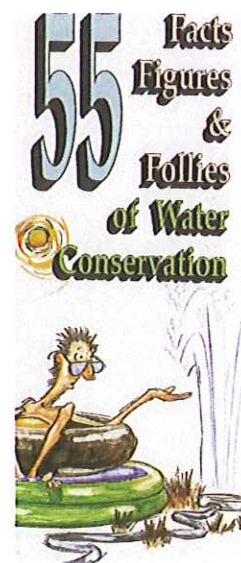
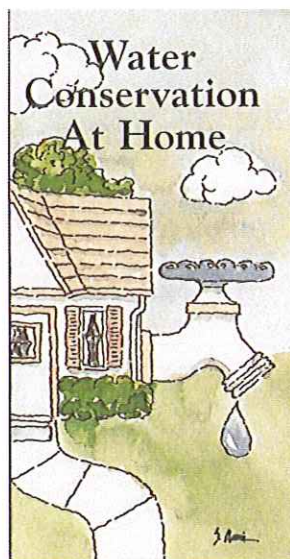
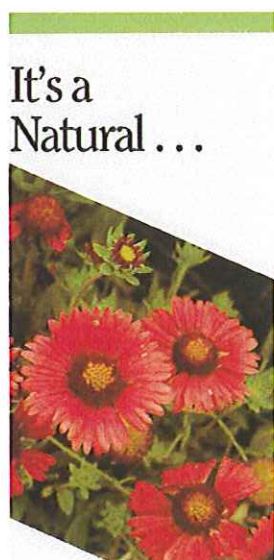
FIGURES 3.4, 3.5 and 3.6
 AWWA Conservation Pamphlets



25 Facts About Water is a list of 25 water facts that encourage conservation (see figure 3.5).

Lets Learn About the Water Cycle diagrams the seven stages of the water cycle (see figure 3.6).

FIGURES 3.7, 3.8, and 3.9
 AWWA Conservation Pamphlets



Its a Natural makes suggestions regarding landscape including planning, design, soils, and irrigation (see figure 3.7).

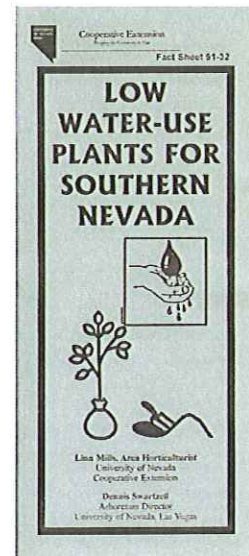
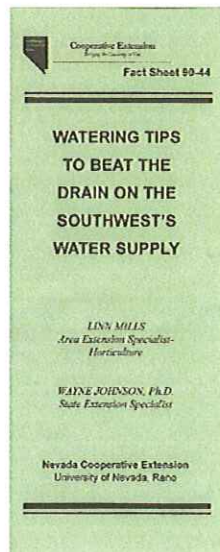
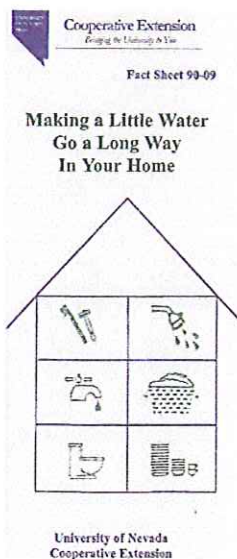
Water Conservation at Home discusses in-home conservation practices for bathroom, kitchen, and outdoor water use (see figure 3.8).

55 Facts Figures & Follies of Water Conservation is similar to "25 Facts about Water" but it provides a bit more information (see figure 3.9).

In addition to the AWWA publications, The University of Nevada Cooperative Extension publishes Fact Sheets that encourage conservation. Fact Sheet 90-09 "Making a Little Water Go a Long Way in Your Home" contains residential conservation tips (see figure 3.10), Fact Sheet 90-40 "Watering Tips to Beat the Drain on the Southwest's Water Supply" provides tips to make landscapes more water efficient (see figure 3.11) and Fact Sheet 91-32 is a list of low water-use plants for southern Nevada (see figure 3.12).

FIGURES 3.10, 3.11, and 3.12

University of Nevada Cooperative Extension Fact Sheets



Conservation measures are divided into two types: (1) Hardware/Equipment and (2) Behavioral/Managerial. Each of these is subdivided into five categories of application: (1) Residential, (2) Landscape, (3) Industrial, Commercial, and Institutional (ICI) (4) Agricultural, and (5) Purveyor. The following conservation measures will be classified first by application and then by type.

B.1 RESIDENTIAL CONSERVATION MEASURES

B.1.1 Behavioral Measures

B.1.1.1 Residential Water Audits. Water audits could target high use customers first and then be offered to all customers. The following elements should be part of an effective audit.

- Purpose for the audit.
- Estimation of use for all fixtures and appliances.
- Check for and repair leaks.
- Evaluation of Landscape (See "Landscape Conservation Measures")
- Evaluation of outdoor water use.
- Evaluate efficiency measures.
- Educate customers using available flyers

An audit should take no more than 30 to 45 minutes.

B.1.1.2 Additional Measures. The sample pamphlets in Appendix A include additional behavioral conservation measures.

B.1.2 Hardware/Equipment Measures

The following is a list of devices/practices that will reduce water consumption in the home.

Measure	Description
<i>Bathroom/Kitchen Fixtures</i>	
Low-flow toilets	1.6 gallons per flush
Toilet retrofit devices	Bladders (bags), dams, early close flappers, other hardware and adjustments
Toilet leak repairs	Includes detection (dye tabs) and replacement of worn parts.
Low-volume shower heads	2.5 gallons per minute @ 80 psi
Showerhead retrofit devices	Includes temporary cutoff valves and restrictors.
Low-volume faucets	2.5 gallons per minute @ 80 psi
Faucet retrofit devices	Includes aerators, activation sensors, self closing and metered valves
Faucet maintenance	Includes washer replacement, repacking, tightening, and cleaning aerators
Water pressure reduction	Only needed if house pressure exceeds what's required
<i>High Efficiency Appliances</i>	
Clothes washers	27 gallons per load
Dish washers	4.5 gallons per load

B.2 LANDSCAPE CONSERVATION MEASURES

B.2.1 Behavioral Measures

B.2.1.1 Landscape Water Audits. Landscape water audits should be conducted on park and golf course irrigation systems and could be considered an option on residential irrigation systems, targeting high-volume users.

- Purpose for the audit.
- Estimation of outdoor use based on meter records.
- Check for and repair leaks.
- Evaluation of Landscape (size, soil, amount of turf, types of plants)
- Evaluation of irrigation system (Timers, Use of drip, Precipitation amounts).
- Efficiency recommendations.
- Educate customers using available flyers

A residential landscape audit should take no more than an hour. Parks and golf courses could take substantially longer.

B.2.1.2 Xeriscape™. Xeriscape is a method of landscaping that employs low-water use plants, turf, ground covers, shrubs and trees. It includes careful planning, soil analysis, and irrigation system design.

B.2.1.3 Additional Measures. The sample pamphlets in Appendix A include additional behavioral conservation measures.

B.2.2 Hardware/Equipment Measures

Landscape hardware measures consist of two basic groups: (1) Landscape materials and (2) irrigation equipment.

Measure	Description
<i>Landscape Materials</i>	
Trees, plants, and grass	Should be well suited to climate and altitude and be drought tolerant
Organic mulch	Grass clippings, leaves, wood chips, bark, and pine needles. Organic mulches help to retain soil moisture and keep ground cool around plants.
Inorganic mulch	Boulders, gravel, pavers, decomposed granite, and stepping stones. Inorganic mulches are generally more for decorative purposes but they reduce the amount of trees, plants, and turf thereby conserving water.
Compost	Made of manure or biosolids and wood, straw, grass, and leaves. Helps plants stay healthy and retains moisture in the soil.
<i>Irrigation Equipment</i>	
Valves	Should be sized to meet requirements and checked periodically for leaks
Sprinkler Heads	Should match water volume requirements of area being irrigated.
Sprinkler Nozzles	Should have proper arc of coverage and proper trajectory.
Irrigation Controllers	Should have required number of stations, programs, and starts. Also rain delays and sensor terminals.
Drip irrigation	Insures water is directed to where it's needed.

B.3 INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL (ICI) CONSERVATION MEASURES**B.3.1 Behavioral and Hardware/Equipment Measures**

B.3.1.1 ICI Water Audits. Since ICI water audits can require a substantial amount of time (4 hours or more), it may be necessary to have a private engineering firm hired by the water user conduct the audit. There is incentive for ICI customers to pay for audits since the results of an audit could translate into substantial savings. An ICI water audit should include the following elements:

- Support from ICI owners, managers, and employees
- Survey/Estimation of facility use based on meter records.
- Calculation of water-related costs.
- Evaluation of efficiency measures.
- Evaluation of payback periods for measures.
- Efficiency recommendations and implementation.
- Tracking and reporting system.

B.3.1.2 Manual Washing. Manual washing is cleaning done on surfaces with hoses and cloths.

MANUAL WASHING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> Surfaces should be swept or brushed off before using water to clean. 	<ul style="list-style-type: none"> High pressure low-volume hoses with automatic shut-off nozzles High-pressure pumps, steam cleaners.

B.3.1.3 Vehicle Washing. Vehicle washing includes manual washing and automated car washes or a combination of both.

VEHICLE WASHING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> Limit number of spray nozzles and set flow rates at lowest volume and pressure required. Adjust nozzles in automated systems so that they take full advantage of gravity and position. Also make sure water shuts off after vehicles have passed. Increase conveyor speeds or reduce rinse cycle time. Sweep wash area before using water to clean. Establish a regular maintenance schedule that includes checking for leaks and making repairs. 	<ul style="list-style-type: none"> Recycling systems. These would include filters and storage tanks. High pressure pumping systems.

B.3.1.4 Kitchens and Restaurants. Kitchen and restaurant conservation is divided into four areas of application; 1. Food and drink preparation, 2. Dishwashing, 3. Garbage disposal and scraping trough, and 4. Ice making.

FOOD AND DRINK PREPARATION

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> • Presoak and wash food service articles in basins instead of running water. • Reduce thawing of food with hot water unless required by law. If required use lower flow. • Avoid running water to melt ice in sinks. • Use full loads in dishwashers and other automated equipment. • Serve water only when requested by customers. 	<ul style="list-style-type: none"> • Low-volume faucets • Hands-free foot pedal valves for faucets • On demand hot water dispensers

DISHWASHING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> • Presoak utensils, dishes, and pots and pans in basins of water instead of using running water prior to loading dishwashing machines. • Scrape food off of plates rather than use running water. • Operate scraping troughs only while dishes are actually being washed. • Assess the water efficiency of the current dishwashing system to determine where improvements might be made. • Always wash full loads in automated machines. • Operate conveyor type dishwashers only when dishes are actually passing through the machine. • Verify that the dishwashing equipment is using the minimum amount of flow recommended by the manufacturer. • Since many older automated dishwashing systems are neither energy nor water efficient, evaluate the cost of retrofitting or replacing existing equipment. • Turn dishwashers off when not in use. • Routinely check all dishwashing equipment to ensure there are no leaks. • Post signs requesting that personnel minimize their use of utensils, dishes, and pots and pans to save water. 	<ul style="list-style-type: none"> • Manual pre-wash sprayers with “dead man” shut off controls. • Low-flow spray heads on all sprayers. • New water efficient dishwashing equipment. • Electronic eye sensors that shut off conveyer type systems when dishes are not passing through the machine.

GARBAGE DISPOSER AND SCRAPING TROUGH

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> • Eliminate disposers and troughs. • Use the minimum acceptable flow rate on all machines. • Reuse wastewater in the mixing chamber of the disposer. 	<ul style="list-style-type: none"> • Garbage strainers (instead of disposers) • Sensors that detect the amount of flow in a disposer and regulate flow accordingly. • Solenoid valves that turn water off when the disposer is off. • Flow regulators for disposer supply lines.

ICE MAKERS

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> • Use the minimum flow rate recommended by the manufacturer on water cooled icemakers. • Adjust machines to produce ice only when it's needed. <p>Collect spent cooling water and reuse it for non-potable purposes.</p>	<ul style="list-style-type: none"> • Air-cooled icemakers. • Re-circulating systems for water-cooled icemakers. • Ice flake machines that use less bleed off than cube machines.

B.3.1.5 Laundries and Laundromats. This section includes measures that are applicable in hotels, motels, hospitals, nursing homes, diaper services, restaurants, and coin operated Laundromats.

LAUNDRIES AND LAUNDROMATS

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> • Operate equipment with full loads only. • Reduce water levels for partial loads. • Back flush filters or softeners only when necessary. 	<ul style="list-style-type: none"> • Computer controlled rinse water reclamation systems. • Wash and rinse water treatment and reclamation systems. • Continuous batch washers. • Ozone laundry systems. • Horizontal axis washers.

B.3.1.6 Swimming Pools. The measures in this section can be applied to commercial and residential swimming pools.

SWIMMING POOLS

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> • Limit the frequency of pool refilling. • Cover the pool with an insulated cover when not in use to reduce losses due to heat and evaporation. • Reduce the level of the pool to avoid losses due to splashing. • Lower the pool temperature. • Back wash filters only when necessary. If backwash is timed, verify that frequency is efficient. • Regularly check pool for leaks and cracks. Keep pool and filter clean to avoid unnecessary backwashing. 	<p>There are no special equipment measures that would help conserve water in pools. It is important however that available equipment is efficient and used properly.</p>

B.3.1.7 Cooling Systems. This section includes measures for three types of cooling systems: 1. Single-pass, 2. Evaporative, and 3. Equipment. Single-pass cooling uses fresh water to cool without re-circulating any of the water used in the first pass. Evaporative coolers are used for cooling in commercial and residential applications and are commonly known as swamp coolers. Equipment cooling includes both single-pass and re-circulating systems that are used to cool equipment and machinery.

SINGLE-PASS COOLING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> Reuse water for landscaping, vehicle washing, or another cooling application that allows for water to be at a higher temperature. Eliminate single-pass systems. 	<ul style="list-style-type: none"> Air-cooled equipment (i.e. compressors, pumps, icemakers, etc...) Automatic controls that insure coolers only operate when needed.

EVAPORATIVE COOLING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> Regularly check for leaks in hoses and pan. Replace pads at least annually. Shut cooler off when building is unoccupied. Annually service the equipment by oiling moving parts and cleaning off accumulated scale or corrosion. 	<p>There are currently no equipment measures for evaporative coolers. The design of the coolers is relatively simple.</p>

EQUIPMENT COOLING

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> Reuse water in single pass systems for other cooling purposes. Examples of reuse include cooling molten materials, landscape, of boiler make-up water. Replace al single pass cooling systems with closed-loop systems or replace water-cooled equipment with air-cooled. 	

B.3.1.8 Heating Systems. This section deals with conservation measures for boilers and steam generators which are used to heat large buildings and multiple-building facilities.

HEATING SYSTEMS

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> Regularly inspect systems for leaks and make repairs. Insulate all piping. Limit boiler bleed-off to a level that satisfies water quality requirements. Discharge blow-down into an expansion tank instead of using cold water to cool it. 	<ul style="list-style-type: none"> Flow meters for make-up and blow-down valves. Automatic controls to discharge blow-down.

B.3.1.9 Leaks and Water Losses. This section covers water conservation measures relating to leaks and losses.

LEAKS AND WATER LOSSES

Behavioral Measures	Hardware/Equipment Measures
<ul style="list-style-type: none"> Regularly check for leaks at all water connections. Keep in mind that higher pressure applications have more incidence of leakage. Regularly check all vessels that contain water for cracks or bad seals. Regularly check all heating and cooling systems. Repair any leaks that are discovered. 	<ul style="list-style-type: none"> Leak detection equipment. This could include sonic or probe type equipment. Any equipment used to stop a leak. This would depend on the material of the pipe or vessel that has a leak.

B.3.1.10 ICI Maintenance Practices. This section reemphasizes maintenance conservation measures for ICI facilities that have been mentioned in previous sections. These measures should become standard procedure at all ICI facilities.

- Create a maintenance schedule that includes schedules for leak detection inspections and meter reading, and repair procedures.
- Monitor water-use records keeping track of any increases or decreases in use.
- Conduct water audits every one to three years.
- Shut off supply lines to areas that are not being used.
- Install pressure reducers where feasible.
- Keep a maintenance schedule to clean cooling and heating equipment regularly.
- Recycle and reuse water when feasible.
- Insulate all hot water pipes.
- Replace old equipment with water saving equipment.
- Install timers wherever possible.
- Educate employees on water saving techniques.

B.4 General Residential Behavioral Measures

This list of conservation behaviors and is divided into four parts: Home, Landscaping, Community, and Miscellaneous.

HOME BEHAVIORS

- When washing dishes by hand, don't let the water run while rinsing. Fill one sink with wash water and the other with rinse water.
- Evaporative coolers require a seasonal maintenance checkup. For more efficient cooling, check your evaporative cooler annually.
- Run your washing machine and dishwasher only when they are full and you could save 1000 gallons a month.
- Use the garbage disposal sparingly. Compost instead and save gallons every time.
- Keep a pitcher of water in the refrigerator instead of running the tap for cold drinks, so that every drop goes down you not the drain.

6. Check your water meter and bill to track your water usage.
7. Wash your produce in the sink or a pan that is partially filled with water instead of running water from the tap.
8. Use a broom instead of a hose to clean your driveway or sidewalk and save 80 gallons of water every time.
9. If your shower can fill a one-gallon bucket in less than 20 seconds, then replace it with a water efficient showerhead.
10. Collect the water you use for rinsing produce and reuse it to water houseplants.
11. We're more likely to notice leaky faucets indoors, but don't forget to check outdoor faucets, pipes, and hoses for leaks.
12. When you shop for a new appliance, consider one offering cycle and load size adjustments. They are more water and energy-efficient than older appliances.
13. Time your shower to keep it under 5 minutes. You'll save up to 1000 gallons a month.
14. Install low-volume toilets.
15. When you clean your fish tank, use the water you've drained on your plants. The water is rich in nitrogen and phosphorus, providing you with a free and effective fertilizer.
16. Put food coloring in your toilet tank. If it seeps into the toilet bowl, you have a leak. It's easy to fix, and you can save more than 600 gallons a month.
17. Plug the bathtub before turning the water on, and then adjust the temperature as the tub fills up.
18. Designate one glass for your drinking water each day. This will cut down on the number of times you run your dishwasher.
19. Don't use running water to thaw food.
20. Grab a wrench and fix that leaky faucet. It's simple, inexpensive, and can save 140 gallons a week.
21. When doing laundry, match the water level to the size of the load.
22. Teach your children to turn the faucets off tightly after each use.
23. Before you lather up, install a low-flow showerhead. They're inexpensive, easy to install, and can save your family more than 500 gallons a week.
24. Soak your pots and pans instead of letting the water run while you scrape them clean.
25. Make sure you know where your master water shut-off valve is located. This could save gallons of water and damage to your home if a pipe were to burst.
26. Turn off the water while you brush your teeth and save 4 gallons a minute. That's 200 gallons a week for a family of four.
27. Make sure your toilet flapper doesn't stick open after flushing.
28. Make sure there are aerators on all of your faucets.

29. Install an instant water heater on your kitchen sink so you don't have to let the water run while it heats up. This will also reduce heating costs for your household.
30. Cut back on rinsing if your dishwasher is new. Newer models clean more thoroughly than older ones.
31. Bathe your young children together.
32. Winterize outdoor spigots when temps dip to 20 degrees F to prevent pipes from bursting or freezing.
33. Insulate hot water pipes so you don't have to run as much water to get hot water to the faucet.
34. Drop that tissue in the trash instead of flushing it and save gallons every time.
35. If your toilet was installed prior to 1980, place a toilet dam or bottle filled with water in your toilet tank to cut down on the amount of water used for each flush. Be sure these devices do not interfere with operating parts.
36. Install water softening systems only when necessary. Save water and salt by running the minimum number of regenerations necessary to maintain water softness.
37. Wash clothes only when you have a full load and save up to 600 gallons each month.
38. Listen for dripping faucets and toilets that flush themselves. Fixing a leak can save 500 gallons each month.
39. Cook food in as little water as possible. This will also retain more of the nutrients.
40. Turn the water off while you shampoo and condition your hair and you can save more than 50 gallons a week.
41. Choose new water-saving appliances, like washing machines that save up to 20 gallons per load.
42. Select the proper size pans for cooking. Large pans require more cooking water than may be necessary.
43. Turn off the water while you shave and you can save more than 100 gallons a week.
44. If you accidentally drop ice cubes when filling your glass from the freezer, don't throw them in the sink. Drop them in a house plant instead.
45. To save water and time, consider washing your face or brushing your teeth while in the shower.
46. For hanging baskets, planters and pots, place ice cubes under the moss or dirt to give your plants a cool drink of water and help eliminate water overflow.
47. Throw trimmings and peelings from fruits and vegetables into your yard compost to prevent from using the garbage disposal.
48. Keep a bucket in the shower to catch water as it warms up or runs. Use this water to flush toilets or water plants.
49. When you are washing your hands, don't let the water run while you lather.
50. Pre-treat stains before washing clothes to avoid re-washing.
51. Use the shortest wash cycle for lightly soil cloths.

- 52. Check washing machine hoses regularly for leaks.
- 53. Do not pre-rinse dishes except in cases of sticky or burn-on food.
- 54. Scrape off food with a utensil or used paper napkin when pre-cleaning for dishwasher.

LANDSCAPE BEHAVIORS

- 1. Check your sprinkler system frequently and adjust sprinklers so only your lawn is watered and not the house, sidewalk, or street.
- 2. Avoid planting turf in areas that are hard to water such as steep inclines and isolated strips along sidewalks and driveways.
- 3. Plant during the spring or fall when the watering requirements are lower.
- 4. Minimize evaporation by watering during the early morning hours, when temperatures are cooler and winds are lighter.
- 5. Use a layer of organic mulch around plants to reduce evaporation and save hundreds of gallons of water a year.
- 6. Divide your watering cycle into shorter periods to reduce runoff and allow for better absorption every time you water.
- 7. Only water your lawn when needed. You can tell this by simply walking across your lawn. If you leave footprints, it's time to water.
- 8. Adjust your lawn mower to a higher setting. Longer grass shades root systems and holds soil moisture better than a closely clipped lawn.
- 9. Use the sprinkler for larger areas of grass. Water small patches by hand to avoid waste.
- 10. Use porous materials for walkways and patios to keep water in your yard and prevent wasteful runoff.
- 11. Direct downspouts and other runoff towards shrubs and trees, or collect and use for your garden.
- 12. Install a rain shut-off device on your automatic sprinklers to eliminate unnecessary watering.
- 13. Choose a water-efficient drip irrigation system for trees, shrubs and flowers. Watering at the roots is very effective, be careful not to over water.
- 14. Reduce the amount of grass in your yard by planting shrubs and ground cover with rock and granite mulching.
- 15. Remember to check your sprinkler system valves periodically for leaks and keep the heads in good shape.
- 16. Don't water your lawn on windy days. After all, sidewalks and driveways don't need water.
- 17. Water your plants deeply but less frequently to create healthier and stronger landscapes.
- 18. When watering grass on steep slopes, use a soaker hose to prevent wasteful runoff.
- 19. Group plants with the same watering needs together to get the most out of your watering time.

20. Remember to weed your lawn and garden regularly. Weeds compete with other plants for nutrients, light, and water.
21. While fertilizers promote plant growth, they also increase water consumption. Apply the minimum amount of fertilizer needed.
22. Avoid installing ornamental water features and fountains that spray water into the air. Trickling or cascading fountains lose less water to evaporation.
23. Buy a rain gauge to track how much rain or irrigation your yard receives. Check with your local water agency to see how much rain is needed to skip an irrigation cycle.
24. Teach your family how to shut off your automatic watering systems. Turn sprinklers off if the system is malfunctioning or when a storm is approaching.
25. Set a kitchen timer when watering your lawn or garden with a hose.
26. Next time you add or replace a flower or shrub, choose a low water use plant for year-round landscape color and save up to 550 gallons each year.
27. Use a screwdriver as a soil probe to test soil moisture. If it goes in easily, don't water. Proper lawn watering can save thousands of gallons of water annually.
28. Avoid over-seeding your lawn with winter grass. Once established, ryegrass needs water every three to five days, whereas dormant Bermuda grass needs water only once a month.
29. Landscape with Xeriscape trees, plants and groundcovers. Call your local conservation office for more information about these water thrifty plants.
30. If you have an evaporative cooler, direct the water drain to a flowerbed, tree, or your lawn.
31. Leave lower branches on trees and shrubs and allow leaf litter to accumulate on top of the soil. This keeps the soil cooler and reduces evaporation.
32. Start a compost pile. Using compost when you plant adds water-holding organic matter to the soil.
33. Use sprinklers that throw big drops of water close to the ground. Smaller drops of water and mist often evaporate before they hit the ground.
34. More plants die from over-watering than from under-watering. Be sure only to water plants when necessary.
35. Water only as rapidly as the soil can absorb the water.
36. Aerate your lawn. Punch holes in your lawn about six inches apart so water will reach the roots rather than run off the surface.
37. When you give your pet fresh water, don't throw the old water down the drain. Use it to water your trees or shrubs.

COMMUNITY BEHAVIORS

1. Encourage your school system and local government to help develop and promote a water conservation ethic among children and adults.
2. Make suggestions to your employer to save water (and dollars) at work.

3. Support projects that use reclaimed wastewater for irrigation and other uses.
4. Encourage your friends and neighbors to be part of a water-conscious community.
5. Pick-up the phone and report significant water losses from broken pipes, open hydrants and errant sprinklers to the property owner or your water management district.

MISCELLANEOUS BEHAVIORS

1. Install covers on pools and spas and check for leaks around your pumps.
2. Periodically check your pool for leaks if you have an automatic refilling device.
3. Use a commercial car wash that recycles water.
4. Don't buy recreational water toys that require a constant flow of water.
5. Use a grease pencil to mark the water level of your pool at the skimmer. Check the mark 24 hours later. Your pool should lose no more than ¼ inch each day.
6. When the kids want to cool off, use the sprinkler in an area where your lawn needs it the most.
7. Make sure your swimming pools, fountains, and ponds are equipped with re-circulating pumps.
8. Wash your car on the grass. This will water your lawn at the same time.
9. Bathe your pets outdoors in an area in need of water.
10. While staying in a hotel or even at home, consider reusing your towels.
11. When backwashing your pool, consider using the water on your landscaping.
12. When you have ice left in your cup from a take-out restaurant, don't throw it in the trash, dump it on a plant.

Lyon County does not have a Landscape code. This Appendix is included because a Code is currently being considered by County leaders. Once the code is complete it will be included in this Appendix.

The following list is taken from the Truckee Meadows Water Authority (TMWA) website. More information on these plants, including color photos can be found at www.tmwlandscapeguide.com.

PERENNIAL FLOWERS

[Artemisia species](#)/Sage or Wormwood (Perennial)—water use: Very Low

[Eriogonum umbellatum](#)/Sulfur Flowered Buckwheat (Perennial)—water use: Very Low

[Achillea species](#)/Yarrow (Perennial)—water use:Low

[Agastache cana](#)/Bubblegum Mint (Perennial)—water use:Low

[Aurinia saxatilis](#)/Basket-of-Gold (Perennial)—water use:Low

[Coreopsis species](#)/Tickseed (Perennial)—water use:Low

[Crocus species](#)/Spring Crocus (Perennial)—water use:Low

[Dianthus species](#)/Pinks (Perennial)—water use:Low

[Eschscholzia californica](#)/California poppy (Perennial)—water use:Low

[Gaillardia grandiflora](#)/Blanket Flower (Perennial)—water use:Low

[Iris germanica](#)/Iris germanica (Perennial)—water use:Low

[Linum species](#)/Flax (Perennial)—water use:Low

[Narcissus species](#)/Daffodil or Narcissus (Perennial)—water use:Low

[Nepeta racemosa](#)/Catmint (Perennial)—water use:Low

[Oenothera species](#)/Evening Primrose (Perennial)—water use:Low

[Perovskia atriplicifolia](#)/Russian Sage (Perennial)—water use:Low

[Sedum species](#)/Stonecrop (Perennial)—water use:Low

[Senecio Cineraria](#)/Dusty Miller (Perennial)—water use:Low

[Stachys byzantina](#)/Lamb's Ears (Perennial)—water use:Low

[Thermopsis montana](#)/No Lupine (Perennial)—water use:Low

[Tulbaghia violacea](#)/Society Garlic (Perennial)—water use:Low

[Alcea rosea](#)/Hollyhock (Perennial)—water use:Moderate

[Antirrhinum majus](#)/Snapdragon (Perennial)—water use:Moderate

[Armeria maritima](#)/Sea Pinks (Perennial)—water use:Moderate

[Aster species](#)/Aster (Perennial)—water use:Moderate

[Echinacea purpurea](#)/Coneflower (Perennial)—water use:Moderate

[Gaura lindheimeri](#)/Gaura (Perennial)—water use:Moderate

[Geranium species](#)/Handy Geranium (Perennial)—water use:Moderate

[Gypsophila species](#)/Baby's Breath (Perennial)—water use:Moderate

[Hemerocallis hybrids](#)/Daylily (Perennial)—water use:Moderate

[Heuchera sanguinea](#)/Coral Bells (Perennial)—water use:Moderate

[Iberis sempervirens](#)/Candytuft (Perennial)—water use:Moderate

[Kniphofia uvaria](#)/Red Hot Poker (Perennial)—water use:Moderate

[Lavandula angustifolia](#)/Lavender (Perennial)—water use:Moderate

[Lilium species](#)/Lily (Perennial)—water use:Moderate

[N/A](#)/Pussy toes (Perennial)—water use:moderate

[Papaver species](#)/Poppy (Perennial)—water use:Moderate

[Penstemon species](#)/Beard Tongue (Perennial)—water use:Moderate

[Platycodon grandiflorus](#)/Balloon Flower (Perennial)—water use:Moderate

[Rudbeckia fulgida](#)/Black-Eyed Susan (Perennial)—water use:Moderate

[Salvia Species](#)/Sage or Salvia (Perennial)—water use:Moderate

[Saponaria species](#)/Soapwort (Perennial)—water use:Moderate

[Tanacetum species](#)/Painted or Michaelmas Daisy (Perennial)—water use:Moderate

[Tulipa species](#)/Tulip (Perennial)—water use:Moderate

[Veronica spicata](#)/Spike Speedwell (Perennial)—water use:Moderate

[Viola species](#)/Violet or Pansy (Perennial)—water use:Moderate

GROUNDCOVERS, VINES, AND GRASSES

[Opuntia polyacantha](#)/Prickly Pear Cactus (Groundcovers)—water use:Very Low

[Clematis species](#)/Clematis (Groundcovers)—water use:Low

[Euphorbia species](#)/Spurge (Groundcovers)—water use:Low

[Helictorichon sempervirens](#)/Blue Oat Grass (Groundcovers)—water use:Low

[Hypericum calycinum](#)/Jacob's Ladder or Aaron's Beard (Groundcovers)—water use:Low

[Juniperus horizontalis](#)/Groundcover Junipers (Groundcovers)—water use:Low

[Lathyrus latifolius](#)/Perennial Sweet Pea (Groundcovers)—water use:Low

[Lonicera species](#)/Honeysuckle (Groundcovers)—water use:Low

[Panicum virgatum](#)/Switch Grass (Groundcovers)—water use:Low

[Polygonum species](#)/Polygonum (Groundcovers)—water use:Low

[Santolina species](#)/Lavender Cotton (Groundcovers)—water use:Low

[Vinca minor](#)/Dwarf Periwinkle (Groundcovers)—water use:Low

[Wisteria sinensis](#)/Chinese Wisteria (Groundcovers)—water use:Low

[Zauschneria californica](#)/California Fuschia (Groundcovers)—water use:Low

[Calmagrostis x acutiflora](#)/Feather Reed Grass (Groundcovers)—water use:Moderate

[Campsis radicans](#)/Red Trumpet Creeper (Groundcovers)—water use:Moderate

[Cerastium tomentosum](#)/Snow in Summer (Groundcovers)—water use:Moderate

[Delosperma cooperi](#)/Hardy Purple Ice Plant (Groundcovers)—water use:Moderate

[Hedera helix](#)/Ivy (Groundcovers)—water use:Moderate

[Helianthemum nummularium](#)/Sunrose (Groundcovers)—water use:Moderate

[Mahonia repens](#)/Creeping Mahonia (Groundcovers)—water use:Moderate

[N/A](#)/Northern seacats (Groundcovers)—water use:moderate

[Phlox subulata](#)/Moss Pink (Groundcovers)—water use:Moderate

[Potentilla neumanniana](#)/Cinquefoil (Groundcovers)—water use:Moderate

[Sedum species](#)/Stonecrop (Groundcovers)—water use:Moderate

[Thymus species](#)/Thyme (Groundcovers)—water use:Moderate

SHRUBS

[Artemisia tridentata var. tridentata](#)/Big Sagebrush (Shrubs)—water use:Very Low

[Atriplex canescens](#)/Four Wing Saltbrush (Shrubs)—water use:Very Low

[Chrysothamnus nauseosus](#)/Rubber Rabbitbrush (Shrubs)—water use:Very Low

[Amelanchier species](#)/Serviceberry or Juneberry (Shrubs)—water use:Low

[Aronia species](#)/Chokeberry (Shrubs)—water use:Low

[Berberis species](#)/Barberry (Shrubs)—water use:Low

[Caragana species](#)/Peashrub (Shrubs)—water use:Low

[Caryopteris x clandonensis](#)/Blue Mist Spiraea (Shrubs)—water use:Low

[Chaenomeles speciosa](#)/Flowering Quince (Shrubs)—water use:Low

[Cytisus species](#)/Broom (Shrubs)—water use:Low

[Elaeagnus commutata](#)/Silverberry (Shrubs)—water use:Low

[Euonymus species](#)/Euonymus (Shrubs)—water use:Low

[Forestiera neomexicana](#)/New Mexico Privet (Shrubs)—water use:Low

[Genista species](#)/Dwarf Broom (Shrubs)—water use:Low

[Hibiscus syriacus](#)/Rose of Sharon (Shrubs)—water use:Low

[Ligustrum species](#)/Privet (Shrubs)—water use:Low

[Lonicera tatarica](#)/Tatarian Honeysuckle (Shrubs)—water use:Low

[Mahonia aquifolium](#)/Oregon Grape (Shrubs)—water use:Low

[Pinus mugo](#)/Mugo Pine (Shrubs)—water use:Low

[Prunus species](#)/Bush Cherry (Shrubs)—water use:Low

[Pyracantha coccinea](#)/Firethorn or Pyracantha (Shrubs)—water use:Low

[Rhus species](#)/Sumac (Shrubs)—water use:Low

[Ribes aureum](#)/Golden Currant (Shrubs)—water use:Low

[Shepherdia argentea](#)/Silver Buffaloberry (Shrubs)—water use:Low

[Symphoricarpos albus](#)/Snowberry (Shrubs)—water use:Low

[Syringa vulgaris](#)/Common Lilac (Shrubs)—water use:Low

[Yucca species](#)/Yucca (Shrubs)—water use:Low

[Acer circinatum](#)/Vine Maple (Shrubs)—water use:moderate

[Amorpha canescens](#)/Leadplant (Shrubs)—water use:moderate

[Buddleia species](#)/Butterfly Bush (Shrubs)—water use:Moderate

[Catalpa x Chilopsis](#)/Chitalpa (Shrubs)—water use:moderate

[Ceratoides lanata](#)/Winterfat (Shrubs)—water use:moderate

[Cercocarpus ledifolius](#)/Mt. Mahogany (Shrubs)—water use:moderate

[Chamaebatiaria millifolium](#)/Fernbush (Shrubs)—water use:moderate

[Chilopsis linearis](#)/Desert or Flowering Willow (Shrubs)—water use:moderate

[Cotoneaster species](#)/Cotoneaster (Shrubs)—water use:Moderate

[Cowania mexicana](#)/Cliffrose (Shrubs)—water use:moderate

[Fallugia paradoxa](#)/Apache Plume (Shrubs)—water use:moderate

[Forsythia species](#)/Forsythia (Shrubs)—water use:Moderate

[Hamamelis x intermedia](#)/Witch Hazel (Shrubs)—water use:Moderate

[Hesperaloe parviflora](#)/Red Yucca (Shrubs)—water use:moderate

[Juniperus chinensis](#)/Sea Green Juniper (Shrubs)—water use:Moderate

[Kerria japonica](#)/Kerria (Shrubs)—water use:Moderate

[Kolkwitzia amabilis](#)/Beautybush (Shrubs)—water use:moderate

[Philadelphus virginalis](#)/Mock Orange (Shrubs)—water use:Moderate

[Picea glauca var. albertiana 'Conica'](#)/Dwarf Alberta Spruce (Shrubs)—water use:Moderate

[Pinus contorta 'Latifolia'](#)/Lodgepole Pine (Shrubs)—water use:moderate

[Potentilla fruticosa](#)/Shrubby Potentilla (Shrubs)—water use:Moderate

[Purshia tridentata](#)/Bitterbrush (Shrubs)—water use:moderate

[R. frangula 'Asplenifolia'](#)/Fernleafed buckthorn (Shrubs)—water use:Moderate

[R. frangula 'Columnaris'](#)/Tall Hedge Buckthorn (Shrubs)—water use:Moderate

[Rhamnus frangulia](#)/Sea buckthorn (Shrubs)—water use:Moderate

[Rosa species](#)/Hardy Shrub Roses (Shrubs)—water use:Moderate

[Spiraea species](#)/Spiraea (Shrubs)—water use:Moderate

[Symphoricarpa x chenaultii](#)/Coralberry 'Hancock' (Shrubs)—water use:Moderate

[Thuja occidentalis](#)/American Arborvitae (Shrubs)—water use:Moderate

[Viburnum species](#)/Viburnum (Shrubs)—water use:Moderate

TREES

[Acer ginnala](#)/Amur Maple (Trees)—water use:Deep Water 10-14 days

[Ailanthus altissima](#)/Tree of Heaven (Trees)—water use:Deep Water 10-14 days

[Calocedrus decurrens](#)/Incense Cedar (Trees)—water use:Deep Water 10-14 days

[Catalpa species](#)/Catalpa (Trees)—water use:Deep Water 10-14 days

[Cedrus atlantica glauca](#)/Blue Atlas Cedar (Trees)—water use:Deep Water 10-14 days

[Celtis occidentalis](#)/Hackberry (Trees)—water use:Deep Water 10-14 days

[Crataegus species](#)/Hawthorn (Trees)—water use:Deep Water 10-14 days

[Elaeagnus angustifolia](#)/Russian Olive (Trees)—water use:Deep Water 10-14 days

[Gleditsia triacanthos inermis](#)/Honeylocust (Trees)—water use:Deep Water 10-14 days

[Juniperus species](#)/Tree Juniper (Trees)—water use:Deep Water 10-14 days

[Maackia amurensis](#)/Maackia (Trees)—water use:Deep Water 10-14 days

[Maclura pomifera](#)/Osage Orange (Trees)—water use:Deep Water 10-14 days

[Malus hybrids](#)/Crabapple (Trees)—water use:Deep Water 10-14 days

[Pinus species](#)/Pine (Trees)—water use:Deep Water 10-14 days

[Platanus acerifolia](#)/Sycamore (Trees)—water use:Deep Water 10-14 days

[Quercus species](#)/Oak (Trees)—water use:Deep Water 10-14 days

[Robinia species](#)/Locust (Trees)—water use:Deep Water 10-14 days

[Sequoiadendron giganteum](#)/Giant Redwood (Trees)—water use:Deep Water 10-14 days

[Ulmus parvifolia](#)/Chinese elm (Trees)—water use:Deep Water 10-14 days

[Zelkova serrata](#)/Zelkova (Trees)—water use:Deep Water 10-14 days

[Aesculus hippocastanum](#)/Common Horsechestnut (Trees)—water use:Deep Water 7-10 days

[Carpinus betulus](#)/Hornbeam (Trees)—water use:Deep Water 7-10 days

[Cotinus coggygria](#)/Smoke Tree (Trees)—water use:Deep Water 7-10 days

[Cupressus glabra](#)/Arizona Cypress (Trees)—water use:Deep Water 7-10 days

[Fraxinus species](#)/Ash (Trees)—water use:Deep Water 7-10 days

[Ginkgo biloba](#)/Maidenhair Tree (Trees)—water use:Deep Water 7-10 days

[Koelreuteria paniculata](#)/Golden Rain Tree (Trees)—water use:Deep Water 7-10 days

[Laburnum watereri](#)/Golden Chain Tree (Trees)—water use:Deep Water 7-10 days

[Liquidambar styraciflua](#)/Sweetgum (Trees)—water use:Deep Water 7-10 days

[Liriodendron tulipifera](#)/Tulip Tree (Trees)—water use:Deep Water 7-10 days

[Malus domestica](#)/Fruiting Apple Tree (Trees)—water use:Deep Water 7-10 days

[Morus alba](#)/Mulberry (Trees)—water use:Deep Water 7-10 days

[Phellodendron amurense](#)/Amur Cork Tree (Trees)—water use:Deep Water 7-10 days

[Picea species](#)/Spruce (Trees)—water use:Deep Water 7-10 days

[Pistacia chinensis](#)/Chinese Pistache (Trees)—water use:Deep Water 7-10 days

[Prunus species](#)/Plum or Cherry (Trees)—water use:Deep Water 7-10 days

[Pyrus Species](#)/Pear (Trees)—water use:Deep Water 7-10 days

[Sophora japonica](#)/Japanese Pagoda Tree (Trees)—water use:Deep Water 7-10 days

[Sorbus species](#)/Mountain Ash (Trees)—water use:Deep Water 7-10 days

[Thuja occidentalis](#)/Arborvitae (Trees)—water use:Deep Water 7-10 days

[Tilia species](#)/Linden (Trees)—water use:Deep Water 7-10 days

[Gymnocladus dioica](#)/Kentucky Coffee Tree (Trees)—water use:Moderate

[Juniperus monosperma](#)/Singleseed Juniper (Trees)—water use:moderate

[Pinus edulis](#)/Pinon Pine (Trees)—water use:moderate

WATER

- www.amsa-cleanwater.org
- www.energystar.gov

DROUGHT

-

- DroughtMonitor@ndmc.unl.edu

LANDSCAPE

- www.usda.gov/news/garden.htm
- www.tmwlandscapeguide.com/landscape_guide/interactive/index.php

EDUCATION

- www.wateruseitwisely.com
- www.washoeet.dri.edu/

INSTITUTIONAL

- www.lvwd.com
- www.snwa.com
- www.co.washoe.nv.us/water_dept/rwpc/regionalplm
- www.tmh20.com
- www.cabq.gov
- www.ci.phoenix.az.us/WATER/wtrteach.html
- www.owue.water.ca.gov/leak/faq/faq.cfm

LEAK DETECTION

- www.who.int/docstore/water_sanitation_health/leakage/begin.html

Locate Your Meter

Most water meters will be located outside in front of your house next to the curb on the street under a steel or concrete lid.

Reading Your Meter

There are two basic types of meters; a dial with a needle that measures in tenths of a cubic foot and a digital meter that measures from 100,000 down to 1 cubic foot. Most meters also have a small triangle on the face called a flow indicator. It will move when there is water passing through it. Read your meter from left to right.

Measuring Water Use Activities

It is possible to measure the water use of certain activities. These activities include but are not limited to the following:

- Shower or bath use.
- Watering the lawn.
- Washing clothes or dishes.
- Flushing a toilet
- Washing a car

To measure the water use of an activity, do the following (in order):

1. Make sure all water off. This includes all faucets (inside and out), appliances, swamp coolers, or icemakers.
2. Write down the meter reading to two decimal places.
3. Perform the activity. Be sure to measure the amount of time in minutes that the activity required.
4. At the end of the activity read the meter again. Subtract the first meter reading from the second one. The result is the amount of water used for the activity in cubic feet. To convert to gallons multiply the result by 7.48. To determine how many gallons per minute were used divide the gallon amount by the number of minutes the activity required. You should now have the water used amount in *gallons per minute*.

Detecting Leaks

1. Make sure all water off. This includes all faucets (inside and out), appliances, swamp coolers, or icemakers.
2. Write down the meter reading and time of day to the minute.
3. Wait at least an hour before reading the meter a second time. Make sure no water is used during the test. Read the meter at the end of the test and record the time to the minute. If the flow indicator is moving during the test you either have a leak or a meter malfunction.

4. Subtract the first meter reading from the second. Multiply the remainder by 7.48. The result is the amount of water in gallons that passed through the meter during the test period. Also record the time duration of the test.
5. Divide the amount of water by the number of minutes in the test. The result is the amount of water that went through the meter in *gallons per minute*.
6. To measure amount lost over time multiply the gallons per minute by the following:
 - 1,440 for gallons per day.
 - 43,920 for gallons per month.
 - 527,040 for gallons per year.
7. Locating a leak is a process of elimination. Shut off one toilet at a time at the wall. Go to the meter and check to see if the flow indicator (triangle) is still moving. If the triangle has stopped you have discovered the leak. If not go on to the next one and repeat the above steps.
8. Check your sprinkler system. Shut off the system at the anti siphon valve and check the meter.
9. Check your main service line. You will need to shut off the valve between your house and the meter. If the meter stops the leak is between the meter and the valve.
10. These steps can be repeated for every fixture and fitting in your home. In the event you cannot locate the leak, you should call a professional plumber to find and fix it.

APPENDIX G – WATER CONSERVATION KITS

The following are examples of water conservation kits sold by Niagara Conservation. Several of these kits can be customized with the SSMWC logo.

PROVIDENCE WATER KIT

Kit Includes: Earth Massage Showerhead, (2) toilet tank banks, aerator, and a pack of leak dye tablets.
Cost: \$15.50



7-PIECE OUTDOOR WATER CONSERVATION KIT

Kit Includes: 6 position garden hose nozzle, rain gauge, 3-hose washer with plastic screen, and male hose end repair kit + female hose end repair kit. **Cost:** \$7.99



10-PIECE INDOOR WHOLE HOUSE KIT

Kit Includes: Prismiere showerhead, 2.2 GPM swivel kitchen aerator, (2) 1.5 GPM dual thread bathroom aerator, leak detection dye tablets, toilet displacement tank bank bag, toilet fill cycle diverter, roll of 1/2"x30" Teflon tape, shower flow rate bag. Cost: \$9.99



CRUNCH WATER USE KITS

Kit Includes: Prismiere showerhead, Earth Premier Adjustable toilet flapper, 2.2 GPM dual thread kitchen aerator, 1.5 GPM dual thread bathroom aerator, and leak detection dye tablets. Cost: \$15.05



WATER CONSERVATION KIT

Kit Includes: Customize Shower meter water displacement bag, (2) flow restrictors, and leak detection tablets. Cost: \$1.99



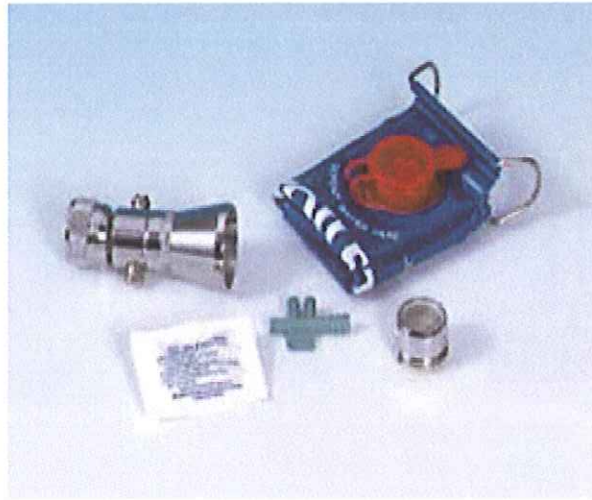
CUSTOMIZED INDOOR WATER AUDIT SURVEY KIT

Kit Includes: Saving water pamphlet, shower meter water displacement bag, drip gauge, leak detection dye tablets, flush volume calculator for toilet. Cost: \$4.99



WATER CONSERVATION KIT FOR THE HOME

Kit Includes: toilet tank bank, toilet tank fill diverter, low-flow showerhead, leak detection tablets, universal home faucet aerator. Cost: \$12.76



CUSTOMIZABLE OUTDOOR WATER CONSERVATION KIT

Kit Includes: Soil Moisture Meter Probe, Lawn Sprinkler Timer, 6-Position Garden Hose Nozzle, Rain Gauge, Efficient Lawn Watering Tips Brochure, and Drip Gauge. Cost: \$29.99



WATER DROP WHEEL

Cost: \$1.89

